THE DESCENT OF MAN

The Descent of Man, and Selection in relation to Sex. By Charles Darwin, M.A., F.R.S., &c. In two volumes. Pp. 428, 475. (Murray, 1871.)

I.

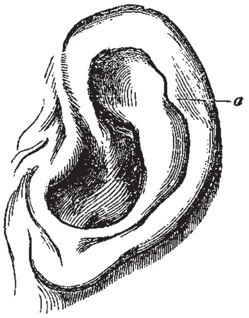
IF Mr. Darwin had closed his rich series of contributions to Science by the publication of the "Origin of Species," he would have made an epoch in Natural History like that which Socrates made in philosophy, or Harvey in medicine. The theory identified with his name has stimulated ethnological and anatomical inquiries in every direction; it has been largely adopted and followed out by naturalists in this country and America, but most of all in the great work-room of modern science, whence a complete literature on "Darwinismus" has sprung up, and there disciples have appeared who stand in the same relation to their master as Muntzer and the Anabaptists did to Luther. Like most great advances in knowledge, the theory of Evolution found everything ripe for it. This is shown by the well-known fact that Mr. Wallace arrived at the same conclusion as to the origin of species while working in the Eastern Archipelago, and scarcely less so by the manner in which the theory has been worked out by men so distinguished as Mr. Herbert Spencer and Prof. Haeckel. But it was known when the "Origin of Species" was published, that instead of being the mere brilliant hypothesis of a man of genius, of which the proofs were to be furnished and the fruits gathered in by his successors, it was really only a summary of opinions based upon the most extensive and long-continued researches. Its author did not simply open a new province for future travellers to explore, he had already surveyed it himself, and the present volumes show him still at the head of his followers. They are written in a more popular style than those on "Animals and Plants under Domestication," as they deal with subjects of more general interest; but all the great qualities of industry and accuracy in research, of fertility in framing hypotheses, and of impartiality in judgment, are as apparent in this as in Mr. Darwin's previous works. To one who bears in mind the too frequent tone of the controversies these works have excited, the turgid rhetoric and ignorant presumption of those "who are not of his school—or any school," and the still more lamentable bad taste which mars the writings of Vogt and even occasionally of Haeckel, it is very admirable to see the calmness and moderation (for which philosophical would be too low an epithet) with which the author handles his subject. If prejudice can be conciliated, it will surely be by a book like this.

It consists of two parts. The first treats of the origin of man, his affinities to other animals, and the formation of the races (or sub-species) of the human family. Besides the obvious interest to all Mr. Darwin's readers of a discussion on the subject of their "proper knowledge," naturalists will find the detailed application of the laws of natural selection to a single common and well-known species an excellent test of their truth and illustration of their difficulties. It is in dealing with the latter, which are never extenuated or passed by, that the author introduces the subject of sexual selection. This is dealt with in the second part, which forms more than two-thirds of the work, and that not only as it affects man, but in its entire range. Reserving this division of the book for a future article, we will endeavour here to give a summary of the course of argument in the earlier portion.

The author, justly assuming that the general principles of natural selection are admitted by all who have examined the evidence on the subject, with the exception of many of "the older and honoured chiefs in natural science," proceeds at once to discuss the proofs of the origin of man considered apart from those affecting all animals in common. The first group of facts adduced to show his kinship with other forms of animal life, relate to the strict correspondence of his bodily parts with those of other mammalia. To say that these structures are the same because they have the same uses, is untrue, for many of them have no use in the sense of active function, and we constantly find the same structures in animals turned to different uses, and the same uses subserved by different structures. To say that the bodies of men and animals are alike because they are formed on the same plan, or because they are the realisation of the same idea in the Creator, is true enough, but is beside the mark; for natural science inquires how or by what steps these things have become so, not why and from what first cause. If one sees two men very much alike, one naturally supposes that they are brothers; if they are rather less so, they may be cousins; if only agreeing in general characters, we recognise them as at least belonging to the same race or nation; and so, when the facts to be accounted for are once ascertained, nothing but prejudice or repugnance to acknowledge our true relations, can explain why it was so long before naturalists admitted the hypothesis of community of origin between men and other animals. What is called the Darwinian theory accounts for the way in which diversities have arisen, and thus has converted an apparently obvious hypothesis into a well-grounded theory. But in expounding the likeness between men and animals, the author does not confine himself to anatomical structure, but shows how the same resemblance extends to the laws of disease, the distribution of parasites, and other minute particulars.

The next argument brought forward is the equally familiar one drawn from the likeness of the human embryo to that of other vertebrata. Then follows an account of the rudimentary organs in man, which in all other species are justly held among the most important indications of affinities. One such rudiment is mentioned which is, we believe, hitherto unrecorded. It is a slight projection of the rim of the helix of the auricle, which would correspond when unfolded to the point of an erect ear. (See illustration.) This occasional abnormity may, perhaps, be recognised by future anatomists as the *Angulus Woolnerii* after its first observer.

In the second chapter Mr. Darwin shows that a consideration of the mental faculties of man, including the use of language, which has been held the greatest difficulty to admitting his kinship to other animals, may rather strengthen than weaken the arguments derived from his bodily structure. Memory and curiosity, jealousy and friendship, and even the power of correct reasoning, and of communication by sounds, are shown to belong to many of the lower animals, while the faculty of reflection and self-consciousness, and "the ennobling belief in the existence of an Omnipotent God," cannot be ascribed to the lowest tribes of the human family. At the same time it is argued that the use of articulate language, the power of forming abstract ideas, and even the sense of right and wrong, may have been gradually acquired by steps which here and there it is not impossible to trace. The question of the origin of the moral sense leads to the proposition of the following theory. Some natural emotions are of great intensity but short endurance, and their force is not easily recalled by memory; others, though less powerful at certain times, exert a constant influence, or one which is only interrupted by being overpowered for a time by the former. Accordingly, during the greater part of life, and always when there is leisure for reflection, the gratification connected with the more violent passions, such as hunger, sexual desire, and revenge, appears small, whereas the social instincts of sympathy and the pleasures of benevolence exert their full power. Hence we find social virtues, as courage, fidelity, obedience, among savages and even animals, long before the "self-regarding" virtues begin to appear. This theory is analogous to that by which Mr. Bain explains the higher character of the pleasures of sight compared with those of smell; they can be more easily recalled ;and corresponds to the distinction drawn by the same writer between the acute and the more "massive" and permanent pleasures.



Human Ear, Modelled and Drawn by Mr. Woolner. *a*. The projecting point.

In the fourth chapter Mr. Darwin discusses the manner in which man was developed. It is shown that the broad facts on which the theory of Natural Selection rests apply to him. He is prolific enough to share in the struggle for existence. In him, as in all organic forms, there is a constant tendency to growth, which being checked and modified by external influences, proceeds in the direction of least resistance, and so produces the variations which are often ascribed to an assumed inherent tendency. Among the various forms produced, those will survive which are best fitted for the surrounding conditions, and they will transmit their character to their descendants, still subject to the same liability to vary. Next the author argues that the mental endowments of man, including language, his social habits, his upright position, and perfect hands, are of direct advantage to him in the struggle with other animals and with his fellows. It has always appeared that the difficult point in the development of man by Natural Selection is at the period when he was more defenceless than an anthropoid ape and less intelligent than the lowest savage; but Mr. Darwin thinks that the transition may have been safely made in some large tropical island where there was abundance of forest and of fruit. That man, once developed, can maintain himself, is obvious from his present existence. The arguments in favour of civilised man being the descendant of savages, which have been so admirably developed by Sir John Lubbock and Mr. Tylor, are of course brought forward in support of the author's view, and the important question is discussed how far we may hope for future improvement in the race by means of continued Natural Selection. Thus, while admitting that the process undergoes many checks and complications among human beings, the author does not assent to the arguments urged by Mr. Wallace that it would cease to operate as soon as the moral faculties came into play.* One human peculiarity which is apparently inexplicable by Natural Selection, the nakedness of the body and presence of a beard, is referred by Mr. Darwin to the operation of Sexual Selection. To this same agency is attributed the origin of the so-called Races of Man, which is discussed with admirable clearness and impartiality in the last chapter, and this leads to the complete exposition of the theory of Sexual Selection which occupies the second part of this work, and must be considered in a future article.

It only remains here to add a word on the account of the affinities and genealogy of man contained in the sixth chapter. As a kind of retribution for the attempt to raise Cuvier's order *Bimana* into a sub-class, not only have most naturalists now reverted to a modified definition of the *Primates* of Linnæus, but Mr. Darwin shows reasons for refusing to the genus *Homo* even the rank of a family in this order, which Prof. Huxley admits, and regards it simply as an aberrant member of the Catarrhine division of the *Simiadæ*. This conclusion, which seems to us to be a just one, will only be distasteful to those who so little appreciate the true characters of man as a spiritual being, that they could feel self-complacency in the brevet-rank of a sub-class.

Mr. Darwin mentions Africa as the possible seat of the Catarrhine progenitors of man, but shows the futility of speculations on this point, until we know more of the recent changes of the earth, the records of palæontology, and the laws affecting the rapidity of animal modifications. He does not advert to Prof. Haeckel's hypothesis of a "Lemuria" in the Indian Ocean, but agrees with him in next tracing the phylum of man to the *Prosimiæ*. These again were developed from "forms standing very low in the deciduate mammalian series" (possibly, as Prof. Huxley suggests, most nearly allied to the existing *Insectivora*), and thus, through the Marsupials and Monotremes from the Reptilian stock, and thence through the *Dipnoi* and Ganoids from the *Urtyhus* of the vertebrate series, represented by the Lancelet alone. Nor does Mr. Darwin stop here, but adds the weight of his judgment to the theory based on the observations of Kowalewsky and Kuppfer, which deduces the primeval *Vertebrata* from a form resembling a Tunicate larva. Perhaps the most brilliant of the many new suggestions in these volumes is one thrown out incidentally in a note to p. 212, and based upon this supposed relation of man to the Ascidians. Beyond the organic world Mr. Darwin does not attempt to trace the genealogy of man. Considering how essential this extension of the theory of evolution is held by men so distinguished as Haeckel, and how keenly the question of Abiogenesis has recently been discussed, the reticence shown in avoiding allusion to the subject is perhaps the most remarkable among the many remarkable characters of this great work. P. H. PYE-SMITH

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* In reviewing in these columns the contributions of the latter eminent writer, we took occasion to quote the estimate he expresses of Mr. Darwin's claims. Should anyone be disposed to overlook the original value of Mr. Wallace's work, he will be corrected by a somewhat similar passage in the present volume. See pp. 137, note, and 416.

OUR BOOK SHELF

Elementary Natural Philosophy. Being a course of nine lectures by J. Clifton Ward, F.G.S., Associate of the School of Mines. (London: Trübner and Co.)

THE attempt to crowd the Elements of Natural Philosophy into nine lectures cannot be otherwise than a failure. This is signally the case with the little book before us. We need hardly go farther than the table of contents to justify the statement. A single lecture is devoted respectively to Magnetism, Voltaic Electricity, Light, and Heat; Pneumatics and Hydrostatics together occupy one lecture, whereas to Frictional Electricity and Sound are given two lectures apiece. Nor does the author confine himself to a simple summary of the leading facts in each of these subjects, he tries to rush over all the field occupied by larger text-books. Hence, important facts are often lightly passed over and comparatively trivial matters made unduly prominent. In Voltaic Electricity, for example, two pages are occupied with a description of the effects of electro-chemical decomposition, when seen on the screen by the aid of the solar microscope. We recognise here, and indeed on every page of the book, those lecture-experiments with which Dr. Tyndall has made the students of the School of Mines so familiar. Mr. Ward has not only drawn largely upon his notes of those lectures, but he imitates Dr. Tyndall's language and style.

Notwithstanding this, we are quite sure Mr. Ward has only himself to blame for the errors which even a cursory glance has revealed to us. On p. 85 we read "Magnetism may be produced by *friction* (of *soft iron* with loadstone or other magnet) by magnetic induction and electricity." Magnetism is *not* produced by friction of soft iron. On pp. 36 and 37 Mr. Ward has fallen into a vulgar and serious error in explaining the electric wind. Speaking of the so-called electric fish, here is what he says:—"If the interior of the Leyden jar be charged positively, negative electricity will be attracted to the head of the fish, from the somewhat blunt point of which it will stream and cause a movement from the knob; while the gliding off of the repelled positive from the finer pointed tail, will counterbalance this movement, and keep the body in equilibrium." The author also speaks of a lighted candle extinguished by the *draft of electricity* streaming from a point. This, of course, is grossly incorrect; it is the movement of contiguous air particles charged similarly by contact and then repelled, that extinguishes the candle, or supports the gold leaf fish.

Though there are some good points in this little book, we regret our inability to recommend it either to schools or students. We venture to think the author betrays his want of experience in teaching science by the over-crowding of his facts; the first lecture, for instance, is accompanied by thirty-three distinct experiments. Teaching—especially science teaching—requires "precept upon precept, line upon line, here a little and there a little:" otherwise there is an almost certain danger of the learner obtaining loose and superficial knowledge, the end of which is not sound instruction, but disastrous conceit.

W. F. B.

Essays on Darwinism. By J. R. R. Stebbing. (Longmans and Co., 1871.)

MR. DARWIN, in his recent work, very truly observes that "false facts are highly injurious to the progress of science, for they often long endure; but that false theories are comparatively innocuous." Mr. Stebbing's work can then do little harm, as it supplies us with no new "facts" whatever, whether true or false. The author is an advocate who serves Mr. Darwin with more zeal than discretion, and who seems but little, if at all, able to appreciate the arguments and objections adduced on the other side. Some who are already convinced of the truth of Darwinism will read with pleasure a series of eloquent and interesting essays in its favour; but, though calculated to confirm a disciple, they are singularly ill-calculated to convert an opponent. Before Mr. Stebbing again writes upon this subject we strongly recommend him to peruse carefully Mr. Grote's "Examination of the Utilitarian Philosophy."

Das Wesen und die Ziele der Chemischen Forschung und des Chemischen Studiums. Akademische Antrittsrede gehalten von Dr. Rudolph Fittig. (Leipzig: Quandt and Händel, 1870. London: Williams and Norgate).

SO busy are the majority of German chemists in research, that it is seldom we are privileged to have their opinions on the object of the science, and the position it should occupy as a study. Dr. Fittig has availed himself of his appointment as Professor of Chemistry in the University of Tubingen to deliver an inaugural address, in which these points are discussed with great clearness and ability. Starting with the assumption that the majority of men estimate the value of a science only by its power to satisfy want and contribute to the comfort of life, Dr. Fittig goes on to claim for chemistry from this point of view the first place among the sciences. "Where," he asks, "is there another science which, in the application of its results to man, almost from his first breath to his last, is so true a companion as chemistry?" and he proceeds to show that it is useful, not so much in explaining what the nourishing constituents of food are, as in disclosing the laws of agriculture, and thus teaching us how to produce means of nourishment. Further, he points out that there is not an article of clothing for the preparation of which chemical knowledge has not been employed, and the same knowledge is necessary to show how the spread of disease may be prevented, and cured when it has taken hold. While these practical results are obtained by the study of chemistry, Dr. Fittig is careful to show that it is a total misunderstanding to suppose that its chief purpose is to discover brilliant colours or new medicines. Thus, without undervaluing the practical importance of the discovery of the aniline colours, it is nevertheless true that the splendid results obtained by Hofmann would have had the same interest for the chemist, had these compounds been colourless and without any technical use. So we are told, "The task of chemistry is to explain the composition of bodies and all phenomena resulting from change of this composition *in order to derive the regular connection and cause of these phenomena, and therefore also of the natural laws which regulate the building up and decomposing of substances.* . . . . We are compelled to multiply the number of substances already existing in nature, not for the sake of producing new bodies and benefiting the world, *but to discover the eternal laws of nature.* He is no true chemist who only prepares new compounds without any definite aim (although, perhaps, he has prepared a large number of compounds hitherto unknown and possibly very beautiful in appearance), and his work has no direct value for science, and can only become valuable when employed by others in its true scientific sense. . . . . True scientific researches must never be given over to chance, they must be systematically planned, begun with a clear consciousness of what is to be attained, and finished in the same spirit." Dr. Fittig has done well to point out so clearly the true aim of the science of chemistry, and to disparage the false estimation of its value, which would make it simply a means of discovering bodies with some technical or useful application. And even in this direction, which must